Meeting of the CCSP Unified Synthesis Product Development Committee on "Climate Change and the United States: Analysis of the Effects and Projections for the Future"
O'Hare Airport Hilton, Chicago, Illinois
March 31-April 1, 2008

Dr. Christopher Miller, Designated Federal Officer of the National Oceanic and Atmospheric Administration (NOAA) Climate Change Science Program (CCSP) Unified Synthesis Product Development Committee called this first FACA meeting to order at 8:25 am and described the implications of FACA. The meeting proceeded in accordance with the published agenda (http://www.cpo.noaa.gov/index.jsp?pg=./ccsp/33_meetings.jsp).

Public Comment
There was no request from the public to make an oral comment or statement during the official public comment period.

Discussion
The purpose of the meeting was to come to agreement on an optimal structure for the report; identify information gaps and how most effectively to fill them; and plan for the zero-order draft. Co-Chair Tom Karl emphasized that one area of emphasis would be identifying "interdependencies" among the various stressors and among the impacts and, therefore, the report would not be just a summary/compilation of previous assessments. Source material would include data sets and models that have been vetted previously. Recent research results could be incorporated as long as they are in press before the final draft of the report. For some areas it is recognized that the research literature is sparse.

Guidance was provided for how the study will be conducted:

(1) Source material will be selected from the CCSP Synthesis and Assessment Products (SAPs), the Intergovernmental Panel on Climate Change (IPCC) assessment, and other assessments deemed relevant.
(2) The material cited must have undergone peer review.
(3) The report will strive for timeliness by identifying and addressing emerging and evolving issues that go beyond present knowledge.

(4) Because impacts of climate change can span sectors and regions and involve several interlocking phenomena, complex interactions (e.g., compound events) and interdependencies will be incorporated in the report.

Co-Chair Jerry Melillo identified some desirable product characteristics: (1) solution-oriented; (2) "big-picture" (e.g., recognizing unintended consequences); (3) wherever possible, use declarative rather than subjunctive statements; (4) be informative, accessible, authoritative, selective, and integrative. A guiding theme is "climate change is about people" (e.g., equity, ecosystem services to society).

The group agreed that the report will be written so that it retains a solid science foundation but, also, is accessible to a broad audience. It was also agreed that some duplication is acceptable, as readers will go to the section that interests them.

The group discussed the advantage of including global information in the sector discussion in recognition that global change impacts are not distributed uniformly across the globe and, also, to give perspective to the U.S. results, i.e., setting the global context for impacts and vulnerability.

Eileen Shea mentioned that there is a challenge for various islands (Micronesia, Marshall Islands, Palau) because site-specific information is not available.

Katharine Hayhoe described the breadth of resources available to identify climate data for impact analyses. Tom Karl noted that if the probability of joint events could be computed, this would promote a more integrative approach.

"Urban" was singled out as a theme area that should be a focus in each sector.

New regional assessments are now becoming available, e.g., a Chicago assessment, Great Lakes assessment, and a Northeast assessment.

Don Boesch provided examples of prominent phenomena to justify a separate section for coastal issues (e.g., tropical storm changes; "dead zones"; invasive species; ocean acidification; sea level rise).

Jonathan Overpeck's discussion of the impacts in the Southwest pointed to the importance of regional heterogeneity (e.g., change in

climate regime across northern Arizona) and the seasonality of some phenomena (e.g., summer-time vs winter-time rainfall), which controls the societal significance of an event.

2nd Day

Adaptation section: the group agreed that a separate section to talk about adaptation issues would be appropriate and particularly the challenges that confront this emerging science, i.e., there are few cases of "best practices". Additionally, the relationship between mitigation and adaptation is critical to avoiding unintended consequences.

With respect to possible positive impacts of climate change on business, there exists "creative entrepreneurship" that motivates people, about which we have very little knowledge.

The discussion on complex interactions/cross-cutting compound events identified categories of phenomena that can be drawn upon for case studies: (1) multiple stressors (e.g., pine-bark beetles destroying forests and the occurrence of wildfires); (2) trade-offs (e.g., 1988 drought and water use trade-offs); (3) unintended consequences (e.g., water usage for biofuels); and (4) the "perfect storm" (e.g., drought, heat wave, and poor air quality occurring concurrently; the 1983 Midwest flood – see Changnon's work).

The Arctic provides an opportunity to examine compound events, e.g., sea ice, storm surge, permafrost.

There was a list of issues/action items under consideration for each sector and region. Highlights include:

Human Well-being

- Add spread on financial and insurance areas
- Add material on urban issues

Human Health

- Add new studies from Don Wuebbles on the Great Lakes
- Consult North American Chapter from IPCC

Ecosystems

- Need a framing solution so it does not appear to be a grab-bag

- Need two or three examples where we can identify clear thresholds
- Need to address overlapping issues: ocean acidification, fisheries, forest fires
- Some discussion on ecosystem services to society

Water Resources

- Regionally different issues, changing character of precipitation (precipitation vs. runoff), flow regimes, streamflow timing, adaptation and constraints vis-à-vis legal and institutional issues
- Need to sort out issues with ecosystem services, groundwater and water quality
- There are some international adaptation examples
- Chesapeake Bay is a potential example
- Drinking water infrastructure, wastewater

Transportation

- Gerry Schwartz on adaptation: Better land-use planning – getting development away from danger zones; how we elevate (or protect by dikes) the various pieces of infrastructure (how do we protect the existing pieces); emergency response – improve regional preparedness and design feeder systems to get people out; improvements in operational strategies. Communities need to inventory the problem. What are the hazards? What are the assets they need to protect?
- Include Gulf Coast case study; changes in paving technology; technologies in managing permafrost prone systems
- Include ideas on land-use

Agriculture

- Add genetics, erosion, intense rainfall, marginal lands coming into production for biofuels
- Reduced frost days but no change in the last frost date
- Take a look at specialty industries (wine, fruit in NE)

Energy

- Say something about impacts of climate policy on energy production and use
- Potential for renewable energy to impact climate

Complex Interactions
Identify case studies, e.g., Chesapeake Bay, water, ecosystems, wildlife, hydropower, heat waves

Coastal
Discussion Point – Is there a rationale for a Coastal Section? (highlight vulnerability, risks, sea level rise, ocean-generated storms, acidification)
Action Items

- Examine understatement of sea level rise
- Use Chesapeake Bay as case study as a way to integrate complexity of management decision making
- Adequate guards against introducing invasive species ballast water
- The impact on cod of changing ocean water properties

Southeast
Discussion Points (1) – How change in climate might affect desirability to live/move there
(2) – Inland issues (water stress, quality of life)
(3) – Drought issue needs explanation
(4) – Don't neglect south Atlantic coast in FL
(5) – Reassignment of Caribbean area to the Islands section
(6) – Hurricanes (CCSP SAP 3.3)
(7) - Limited water storage capacity, likelihood of more frequent droughts
(8) - Restoration of Everglades

West
Discussion Points (1) – Water scarcity (looking at changes that have already occurred)
(2) – Rapid urban expansion and increased heat, affecting quality of life
(3)– Complex interactions between climate change, invasive species and fire (landscape transformation)
(4) – May be on the edge of a temperature threshold because it is already so high
(5)- Immigration due to environmental effects of drought in Mexico
(6) - This is also an area of tribal lands
(7) - Snowbirds arriving later and leaving earlier (opposite to Alaska)

Hawaii and Pacific Islands

Discussion Point – Water availability, coastal inundation, sea level rise, ecosystems (fisheries and tourism), traditional knowledge of indigenous peoples

Action Items

- Add Caribbean (need to recruit several people to assist), discuss invasive species

Northeast

Action Items

- Need to add lake effect snow, look at some positive outcomes, mention recreation

Great Plains

Main Discussion Point – Water, agriculture, urban centers

Action Items

- Discuss water from aquifers
- Can't say anything conclusive about tornadoes
- Grassfires and invasive species are local issues

Midwest

Discussion Point – Small lake issues, Mississippi and Ohio River Basins, night-time temperatures (drawing from Great Lakes Assessment, Chicago Assessment)

Action Items

- Don Wuebbles will edit, including stories
- Look for adaptation strategies
- Cross reference what Hatfield will have in agricultural resources

Pacific Northwest

Discussion Points (1) Need to put emphasis on people
(2) Multiple stresses and thresholds, forest fires, ocean acidification, including discussions of how the coastal ocean affects resources

Action Items

- Ed Miles will provide more input on adaptation

Alaska

Discussion Point – vulnerabilities (incl. terrestrial methane, decomposition)

Action Items

- Emphasize downstream impacts, including people (the indigenous component)

Meeting Decisions and Actions

There was a general review of the remaining schedule of events leading to the zero-order draft.

The "Pathways…" section of the report will be very important since there are areas where the U.S. research investment has been small (e.g., adaptation for ecosystems).

An introductory section will be inserted before the "spreads" to give context.

Each "sector" section will have some reference to adaptation.

The group will provide a list of suggested reviewers for the NRC review panel.

Evan Mills of the Lawrence Berkeley National Lab will be contacted for input on the insurance section.

The next meeting is scheduled for May 19-20 at the same location. Following the NRC review, the third meeting is currently scheduled for September 3-4.

Attendance List

Virginia Burkett (USGS)
Jerry Hatfield (USDA)
Tom Karl (NOAA)
Jay Lawrimore (NOAA)
Dave McGuire (USGS)
Tom Peterson (NOAA)
Roger Pulwarty (NOAA)
Eileen Shea (NOAA)
Dave Anderson (NOAA)
Michael Savonis (DOT)
Don Boesch (Univ. of Maryland)
Stewart Cohen (Environment Canada) – via phone
Katharine Hayhoe (Texas Tech)
Tony Janetos (PNNL)
Jim McCarthy (Harvard)
Jerry Melillo (Marine Biological Laboratory)
Ed Miles (Univ. of Washington)
Jonathan Patz (Univ. of Wisc.) - via phone
Michael Wehner (LBNL)

Thomas Wilbanks (Oak Ridge Nat. Lab)
Don Wuebbles (Univ. of Ill)
Brad Udall (Univ. of Colorado)
John Stone (Carleton University) – via phone
Gerry Schwartz (Independent Scholar)
Lynne Carter (Adaptation Network)
Jonathan Overpeck (Univ. of Arizona) – via phone
John Walsh (University of Alaska – Fairbanks)
Nancy Grimm (Arizona State University)
Susan Hassol (STG consultant)
Chris Miller (NOAA)
Bill Murray (STG)
Sara Veasey (NOAA)
Anne Waple (STG)
Susan Hassol (Climate Communication)
Marlene Kaplan (NOAA)
Jolene McGill (NOAA)
Brian Jackson (UCAR)